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CLAIMS

1. - A method for the provision of telecommunications services in an environment in which there are a plurality of systems working according to different standards (WLAN, 5 UMTS) and reachable from a terminal (T) in an integrated way, wherein at least one of said services can be provided by several systems of said plurality, said method being characterised in that it includes with regard to the request of provision of said at least one service, the 10 steps of :

- verifying the availability for the provision of the requested service of at least a first (WLAN) and a second (UMTS) system of said plurality, and

- selecting, in an automatic and dynamic way, at 15 least one between said first (WLAN) and said second (UMTS) system of said plurality for the provision of the requested service.

2. - The method as recited in claim 1, characterised in that it includes the steps of:

- 20 - a) selecting, among said plurality of systems, at least said first (WLAN) and a second (UMTS) system, said first system (WLAN) forming with regard to said second system (UMTS), a resource to be exploited in a preferential way; said step of selecting being able to 25 bring to the subdivision of said services into:

- a first set of services to be substantially provided through said second system (UMTS), and

- a second set of services to be provided through both said first system (WLAN) and said second 30 system(UMTS),

- b) in the case (102) of a request for provision of a service within said first set, verifying (104) the availability of said second system for providing said service of said first set as requested, supplying (106)

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and not supplying (110) respectively said service of said first set through said second system (UMTS), depending on whether or not said second system is available,

- c) in the cases (112, 127, 136) of a provision request for a service of said second set,

- c1) verifying (114, 128, 138) the availability of said first system (WLAN) in order to provide said service of said second set, as requested, and providing (116) said service of said second set, as requested, through said first system (WLAN), if said first system is available.

- c2) if said first system (WLAN) is unavailable for the transmission of a said service of said second set as requested, verifying the availability of said second system (UMTS) to provide said service of said second set, as requested, and providing (120, 132, 142) and not providing (126, 134, 144) said service of said second set, as requested, depending on whether or not said second system (UMTS) is available for the provision of said service of said second set, as requested.

3. - The method as recited in claim 2, characterised in that said selecting step is carried out so as to find out, within said first set, a subset of services that could be provided in at least a condition of modified communication resources, and by the fact that in the presence (108) of a provision request for a service of said subset, it includes the step of verifying (104) the unavailability of said second system (UMTS) for the provision of said service of said subset as requested and, once said unavailability has been verified, the step of re-negotiating (109) the provision request whereby said service of said subset is again requested for the provision in a condition of modified communication

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resources.

4. - The method as recited in claim 2 or claim 3, characterised in that said selecting step is carried out so as to lead, within said second set, to a respective  
5 subset of services that are deliverable in at least one condition of modified communication resources, and in that, when there is (112) a provision request for a service of said respective subset, it comprises the steps of verifying (114) the unavailability of at least one  
10 between said first (WLAN) and said second (UMTS) system for the provision of said service of said respective subset as requested and, after verifying said unavailability (114, 118), the step of re-negotiating (124) the provision request, whereby the provision of said  
15 service of said respective subset is requested again in a condition of modified communication resources.

5. - The method as recited in claim 3 or claim 4, characterised in that said selecting step is carried out so as to be able to lead, within at least one between said  
20 set and said respective subset, to services that may be provided under a plurality of conditions of modified communication resources, and in that the method includes the step of repeatedly re-negotiating (109, 124) the request for service provision under subsequently modified  
25 communication resources.

6. - The method as recited in any of the previous claims 2 to 5, characterised in that said selecting step comprises the step of subdividing said services into a first set comprising services of conversational class and  
30 a second set comprising services included in at least one class among the classes of streaming services, interactive services, and background services.

7. - The method as recited in claim 4 and in claim 6, characterised in that said respective subset of services

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of said second set includes streaming class services.

8. - The method as recited in any of the previous claims, characterised in that the selecting step is carried out by selecting said systems in the group formed  
5 by the mobile communication systems.

9. - The method as recited in claim 8, characterised in that the selecting step is carried out by selecting said systems in the group formed by the UMTS, WLAN and 802.11 systems.

10 10. - The method as recited in any of the previous claims, characterise in that it comprises the step of verifying the availability of said first system (WLAN) on the basis of a criterion of admission control of the users, by detecting the performance degradation of said  
15 first system as the number of users increases.

11. - The method as recited in claim 10, characterised in that it comprises the steps of:

- detecting the total bit rate available to the active users on said first system (WLAN),
- 20 - considering said first system as unavailable for a new user when the bit rate available upon the possible admission of the new user reaches a threshold value.

12. - The method as recited in any of the previous claims, characterised in that it comprises the step of  
25 detecting the availability of said second system (UMTS), by defining a load parameter ( $\eta$ ) of said second system and by considering said second system as unavailable when said load parameter reaches a threshold value.

13. - The method as recited in claim 12,  
30 characterised in that said load parameter ( $\eta$ ) is a parameter derived on the basis of "pole capacity".

14. - A system for providing telecommunications services in an environment wherein a plurality of telecommunications systems are provided that operate

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according to different standards (WLAN, UMTS) and that may be accessed from a terminal (T) in an integrated manner, in which at least one of said services is deliverable by more telecommunications systems of said plurality, the  
5 system being characterised in that it incorporates a module (10) capable, when there is a provision request for said at least one service, of co-operating with said plurality of telecommunications systems with the aim of:

- verifying the availability for the provision of the  
10 service requested, of at least a first (WLAN) and a second (UMTS) system of said plurality of telecommunications systems, and

- selecting, in an automatic and dynamic way, between said telecommunications systems said at least a first  
15 (WLAN) and a second (UMTS) system of said plurality for the provision of the service requested.

15. - The system as recited in claim 14, characterised in that said module (10) is integrated into a controller element common to said at least a first  
20 (WLAN) and a second (UMTS) system of said plurality.

16. The system as recited in claim 14 or claim 15, characterised in that said module is configured:

- a) to select, within said plurality of telecommunications systems, said at least a first (WLAN)  
25 and said at least a second (UMTS) system, said first system (WLAN) forming with regard to said second system (UMTS), a resource to be exploited preferably; said selection being able to bring to the subdivision of said services into:

30 - a first set of services substantially deliverable only by means of said second system (UMTS), and

- a second set of services that are deliverable by said first system (WLAN) as well as by said second system (UMTS),

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- b) in the case (102) of a request for provision of a service within said first set, to verify (104) the availability of said second system for providing said service of said first set as requested, by providing (106) or not providing (110) respectively said service of said first set through said second system (UMTS), depending on whether said second system is available or unavailable,

- c) in the case (112, 127, 136) of a provision request for a service within said second set,

10           - c1) to verify (114, 128, 138) the availability of said first system (WLAN) for providing said service of said second set as requested, and to deliver (116) said service of said second set as requested by means of said first system (WLAN) if  
15           said first system is available;

          - c2) if said first system (WLAN) is unavailable to provide said service of said second set as requested, to verify the availability of said second system (UMTS) for providing said service of said  
20           second set as requested, and to provide (120, 132, 142) and not provide (126, 134, 144) said service of said second set, as requested, depending on whether said second system (UMTS) is available or unavailable for the provision of said service of said second set,  
25           as requested.

17. - The system as recited in claim 16, characterised in that said module (10) is configured to conduct said selecting step so as said selection can lead to the presence, within said first set, of a subset of  
30           services deliverable in at least a condition of reduced communication resources, and in that, in the case (108) of a provision request of a service of said subset, said module (10) is configured to verify (104) the unavailability of said second system (UMTS) for the

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provision of said service of said subset as requested, and, once said unavailability has been verified, to re-negotiate (109) the provision request, whereby said service of said subset is requested again for the  
5 provision in a condition of reduced communication resources.

18. - The system as recited in claim 16 or in claim 17, characterised in that the module (10) is configured to conduct said selecting step in such a way that said  
10 selection can lead, within said second set, to a respective subset of services, capable of being provided in at least a condition of reduced communication resources, and in that in the case (112) of a provision request for a service of said respective subset, said  
15 module (10) is configured to verify (114) the unavailability of at least one between said first (WLAN) and second (UMTS) system for the provision of said service of said respective subset as requested and, once said unavailability (114, 118) has been verified, to re-  
20 negotiate (124) the provision request whereby the provision of said service of said respective subset is requested again in a condition of reduced communication resources.

19. - The system as recited in claim 17 or in claim  
25 18, characterised in that said module (10) is configured to conduct said selecting step in such a way that said selection can lead, within at least one between said set and said respective subset, to services that can be provided in a plurality of conditions of modified  
30 communication resources, and in that said module (10) is configured to repeatedly re-negotiate (109, 124) the request for service provision under conditions of subsequently modified communication resources.

20. - The system as recited in any of the previous

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claims 16 to 19, characterised in that said module (10) is configured in a way that said selecting step can lead to the subdivision of said services into a first set comprising services of conversational class and a second  
5 set of services comprising services included in at least one class among the classes of the streaming services, interactive services, and background services.

21. - The system as recited in claim 18 and claim 20, characterised in that said respective subset of services  
10 of said second set comprises services of a streaming class.

22. - The system as recited in any of the previous claims 14 to 21, characterised in that said module (10) is configured to co-operate with mobile communication  
15 systems, such as said telecommunications systems of said plurality.

23. - The system as recited in claim 22, characterised in that said module (10) is configured to co-operate with telecommunications systems included in the  
20 group formed by the UMTS, WLAN and 802.11 systems.

24. - The system as recited in claim 23, characterised in that said module (10) is integrated into a radio network type controller or RNC controller.

25. - The system as recited in any of the previous  
25 claims 14 to 24, characterised in that said module (10) is configured to verify the availability of said first system (WLAN) on the basis of a criterion of admission control of the users, by detecting the performance degradation of said first system as the number of users increases.

30 26. - The system as recited in claim 25, characterised in that said module (10) is configured to:

- detect the total bit rate available to the users active on said first system (WLAN),
- consider said first system unavailable for a new



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user when the bit rate available following the possible admission of the new user reaches a threshold value.

27. - The system as recited in any of the previous  
5 claims 14 to 26, characterised in that said module (10) is configured to detect the availability of said second system (UMTS) by defining a load parameter ( $\eta$ ) of said second system and by considering said second system as unavailable when said load parameter reaches a threshold  
10 value.

28. - The system as recited in claim 27, characterised in that said load parameter ( $\eta$ ) is a parameter derived on the basis of "pole capacity".

29. - A Computer Program Product that may be directly  
15 loaded in the internal memory of a digital computer and that comprises portions of software code to carry out the method according to any of the claims 1 to 13, when said product is run on a computer.